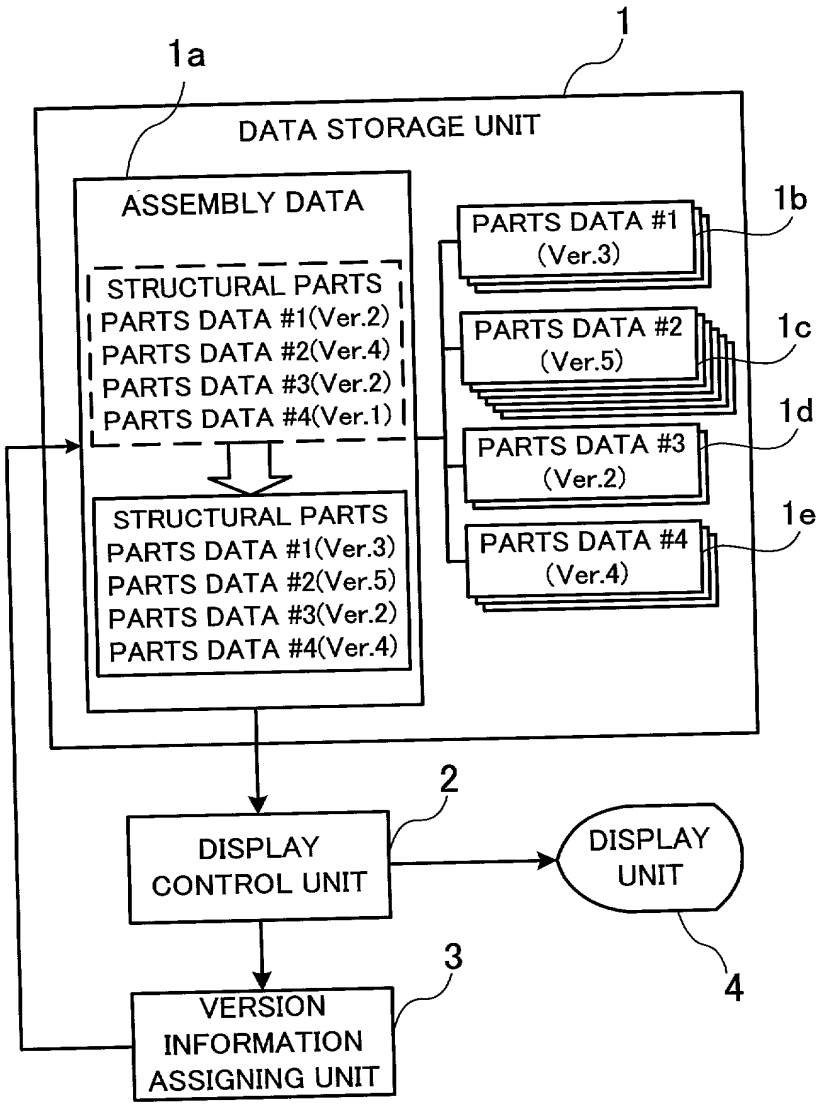

1
1a
DATA STORAGE UNIT
ASSEMBLY DATA
STRUCTURAL PARTS
PARTS DATA #1(Ver.2)
PARTS DATA #2(Ver.4)
PARTS DATA #3(Ver.2)
PARTS DATA #4(Ver.1)
STRUCTURAL PARTS
PARTS DATA #1(Ver.3)
PARTS DATA #2(Ver.5)
PARTS DATA #3(Ver.2)
PARTS DATA #4(Ver.4)
1b
PARTS DATA #1
(Ver.3)
1c
PARTS DATA #2
(Ver.5)
1d
PARTS DATA #3
(Ver.2)
1e
PARTS DATA #4
(Ver.4)
2
DISPLAY
CONTROL UNIT
DISPLAY
UNIT
4
3
VERSION
INFORMATION
ASSIGNING UNIT

FIG. 1

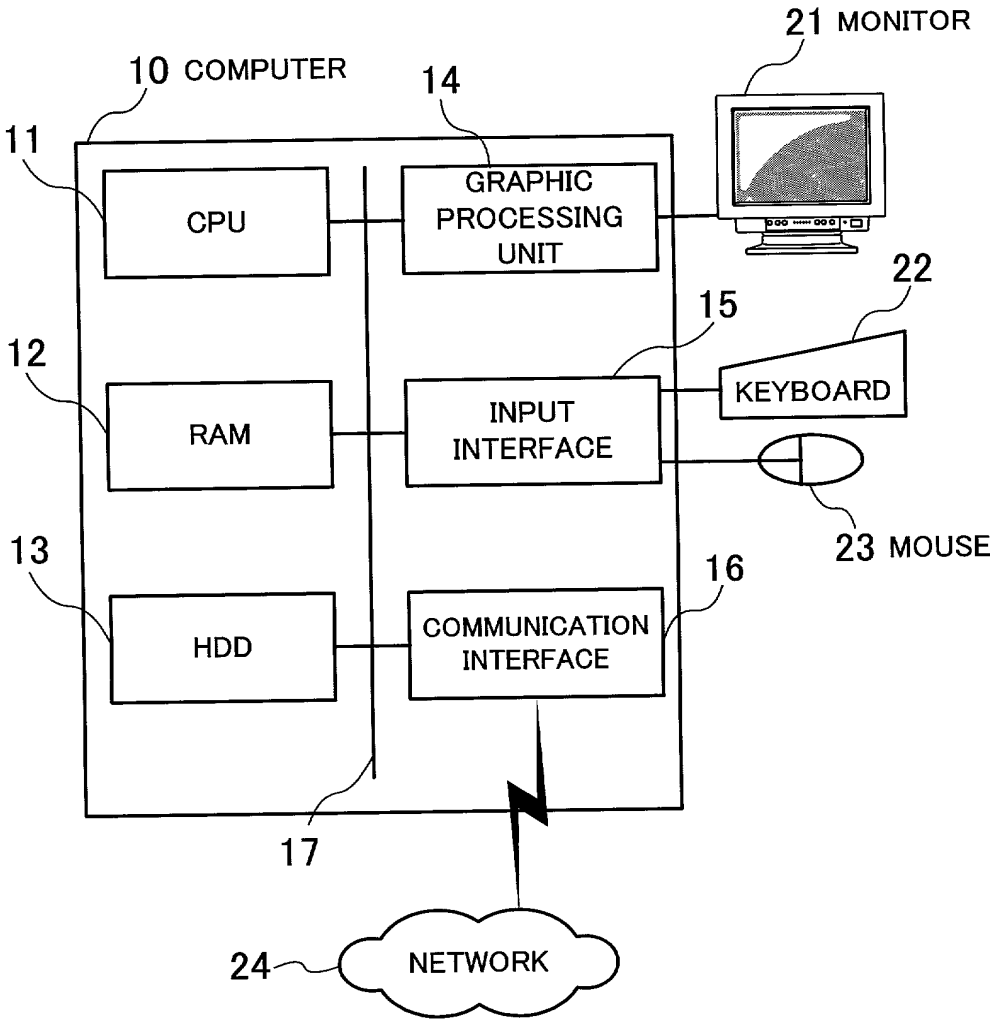

21 MONITOR
10 COMPUTER
14
11
CPU
GRAPHIC PROCESSING UNIT
22
15
12
RAM
INPUT INTERFACE
KEYBOARD
23 MOUSE
13
16
HDD
COMMUNICATION INTERFACE
17
24
NETWORK

FIG. 2

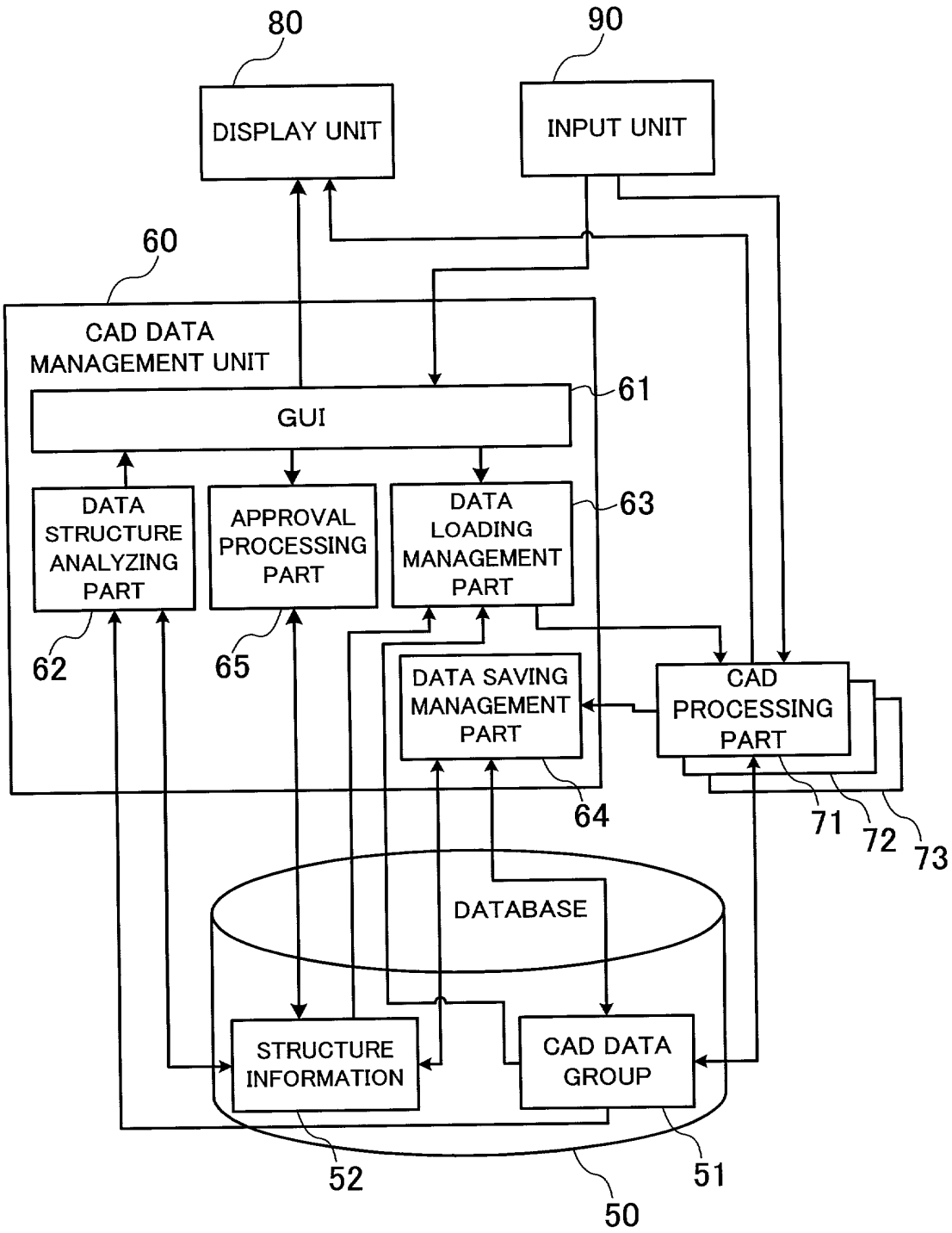
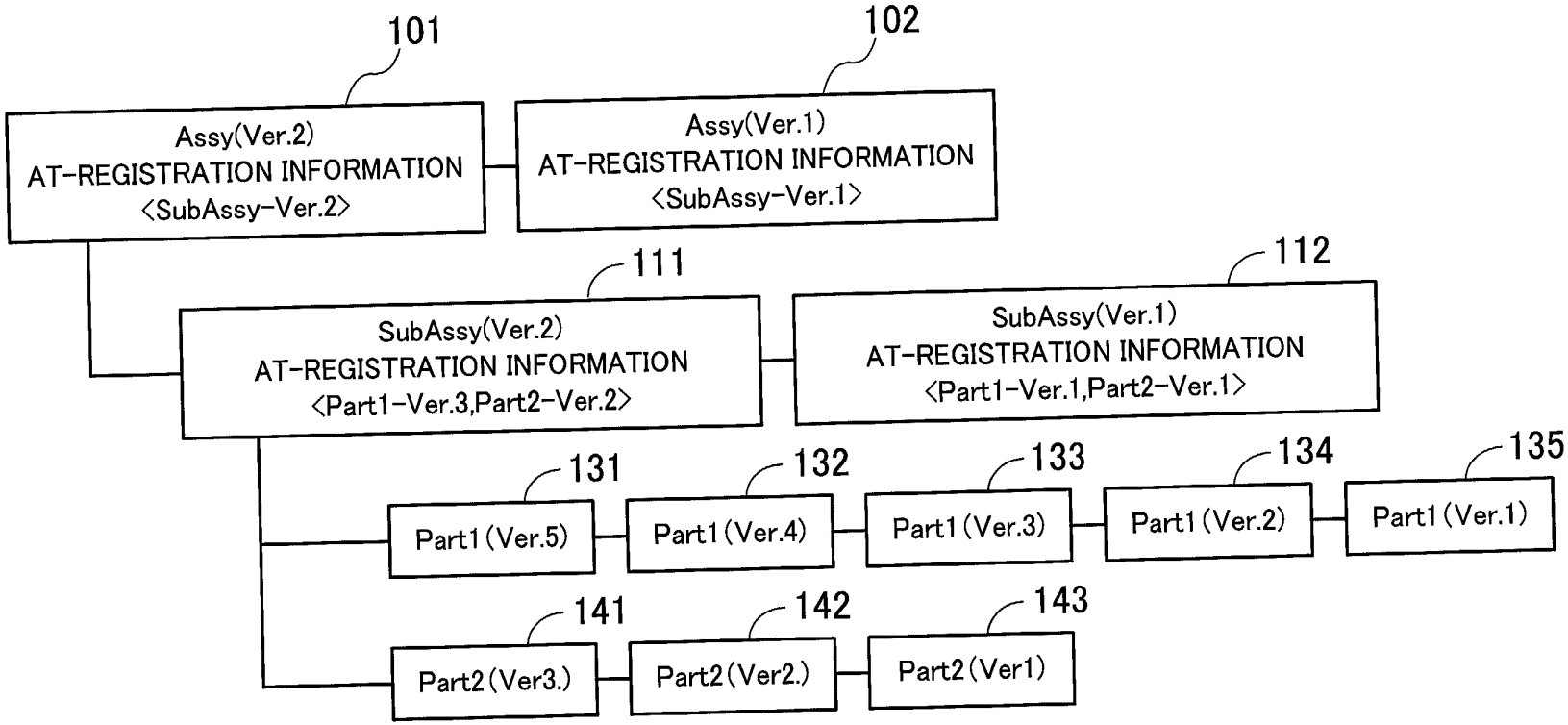

80
90
DISPLAY UNIT
INPUT UNIT
60
CAD DATA
MANAGEMENT UNIT
61
GUI
DATA
STRUCTURE
ANALYZING
PART
APPROVAL
PROCESSING
PART
DATA
LOADING
MANAGEMENT
PART
63
62
65
DATA SAVING
MANAGEMENT
PART
CAD
PROCESSING
PART
64
71
72
73
DATABASE
STRUCTURE
INFORMATION
CAD DATA
GROUP
52
51
50

FIG. 3



EXAMPLE OF DATA STRUCTURE IN DB

FIG. 4

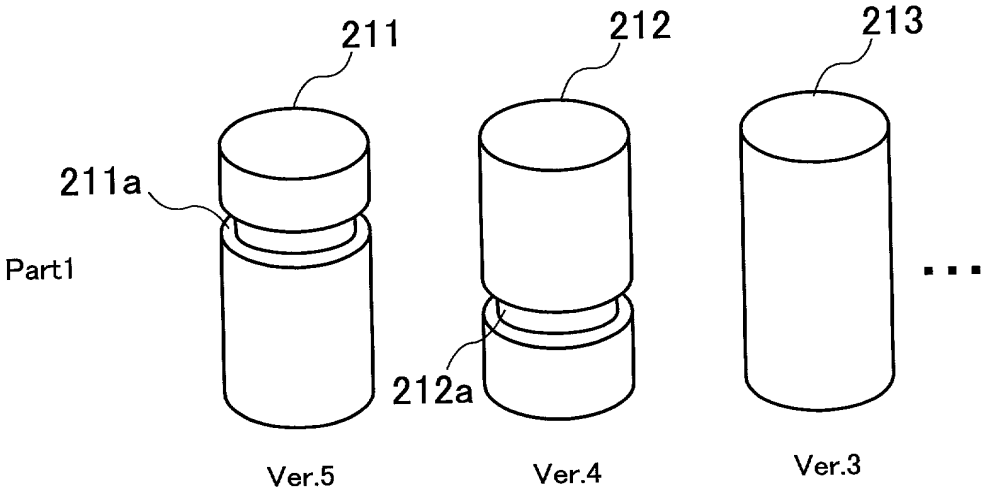
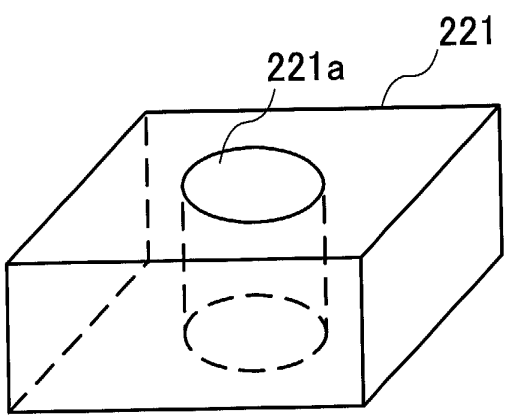


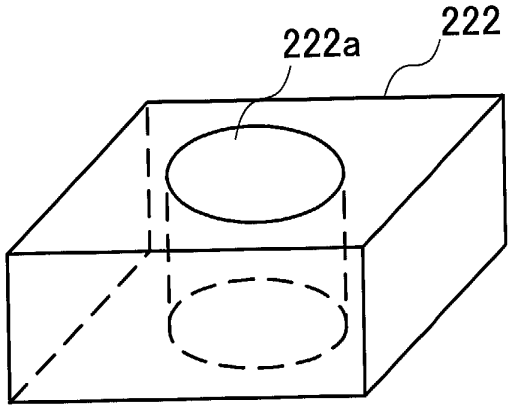
FIG. 5(A) FIG. 5(B) FIG. 5(C)

Part2



Ver.3

FIG. 6(A)



Ver.2

...

FIG. 6(B)

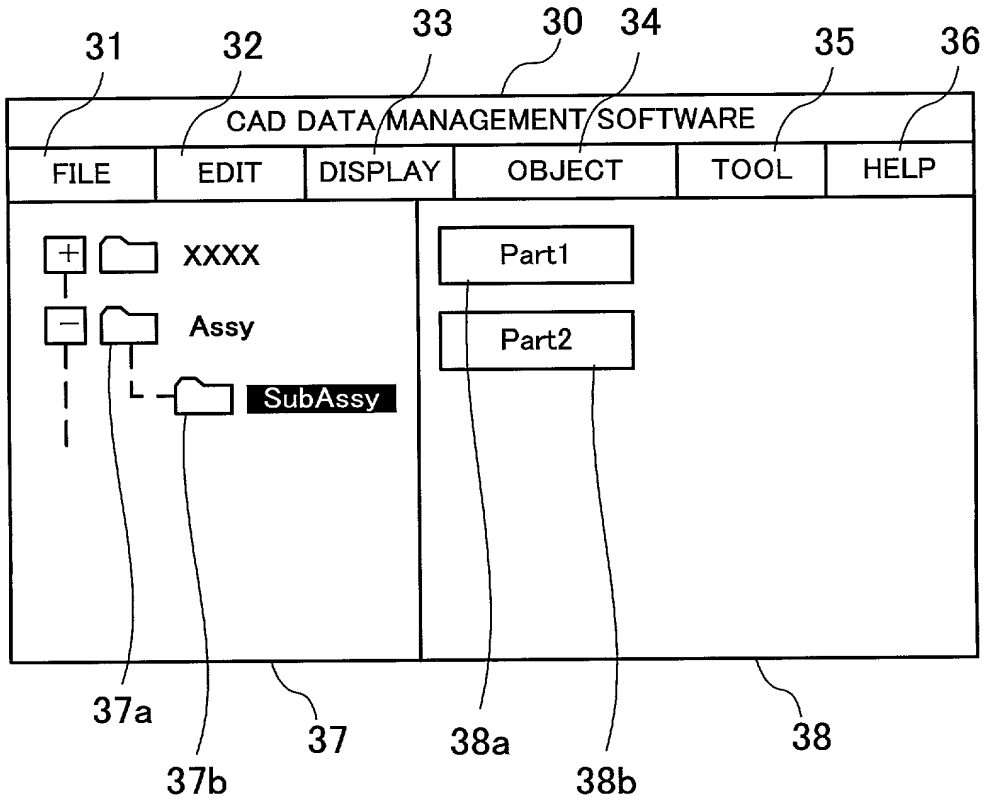

31
32
33
30
34
35
36
CAD DATA MANAGEMENT SOFTWARE
FILE
EDIT
DISPLAY
OBJECT
TOOL
HELP
XXXX
Assy
SubAssy
Part1
Part2
37a
37b
37
38a
38b
38

FIG. 7

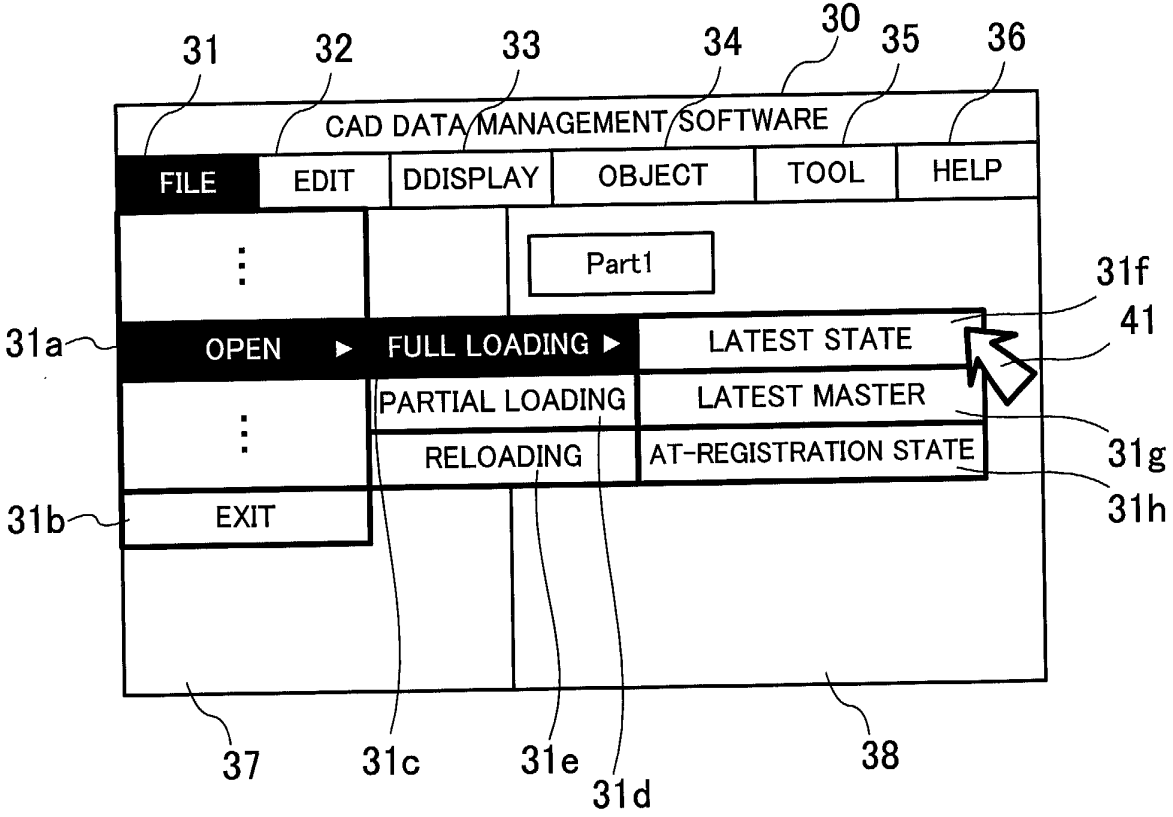

31
32
33
34
30
35
36
CAD DATA MANAGEMENT SOFTWARE
FILE
EDIT
DDISPLAY
OBJECT
TOOL
HELP
Part1
31f
41
31a
OPEN
FULL LOADING
LATEST STATE
PARTIAL LOADING
LATEST MASTER
31g
RELOADING
AT-REGISTRATION STATE
31h
31b
EXIT
37
31c
31e
31d
38

FIG. 8

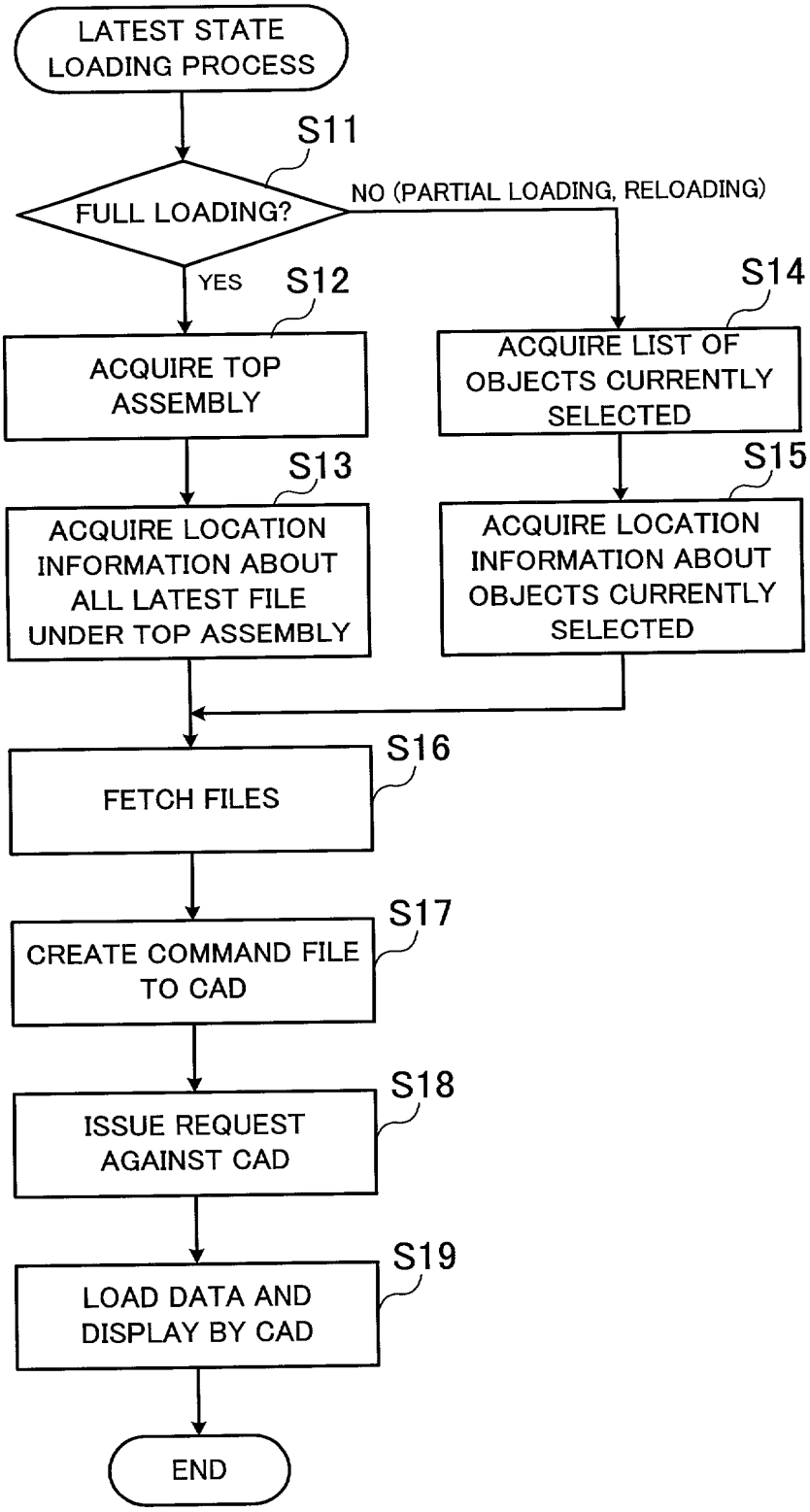
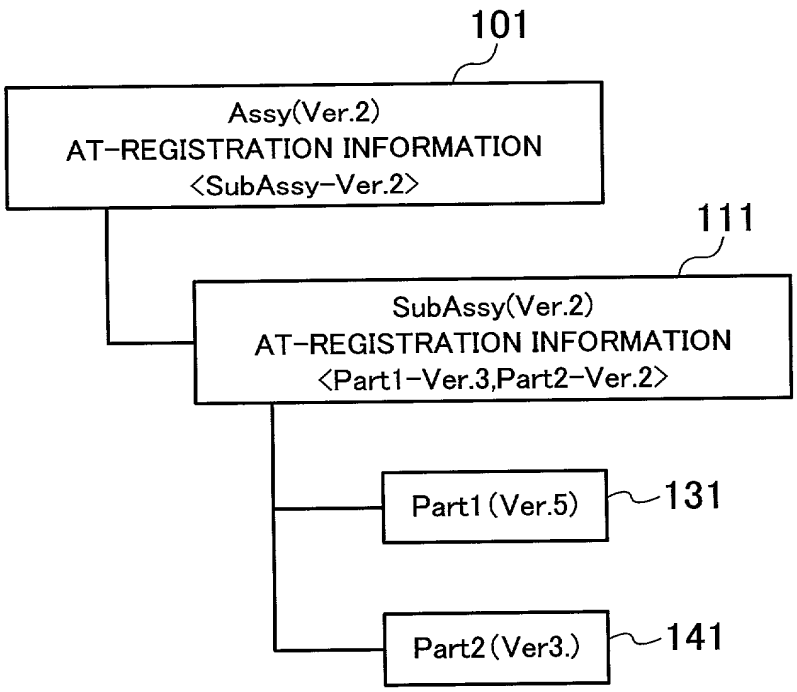

LATEST STATE LOADING PROCESS
S11
FULL LOADING?
NO (PARTIAL LOADING, RELOADING)
YES
S12
ACQUIRE TOP ASSEMBLY
S13
ACQUIRE LOCATION INFORMATION ABOUT ALL LATEST FILE UNDER TOP ASSEMBLY
S14
ACQUIRE LIST OF OBJECTS CURRENTLY SELECTED
S15
ACQUIRE LOCATION INFORMATION ABOUT OBJECTS CURRENTLY SELECTED
S16
FETCH FILES
S17
CREATE COMMAND FILE TO CAD
S18
ISSUE REQUEST AGAINST CAD
S19
LOAD DATA AND DISPLAY BY CAD
END

FIG. 9



EXAMPLE OF LOADING LATEST STATE

FIG. 10

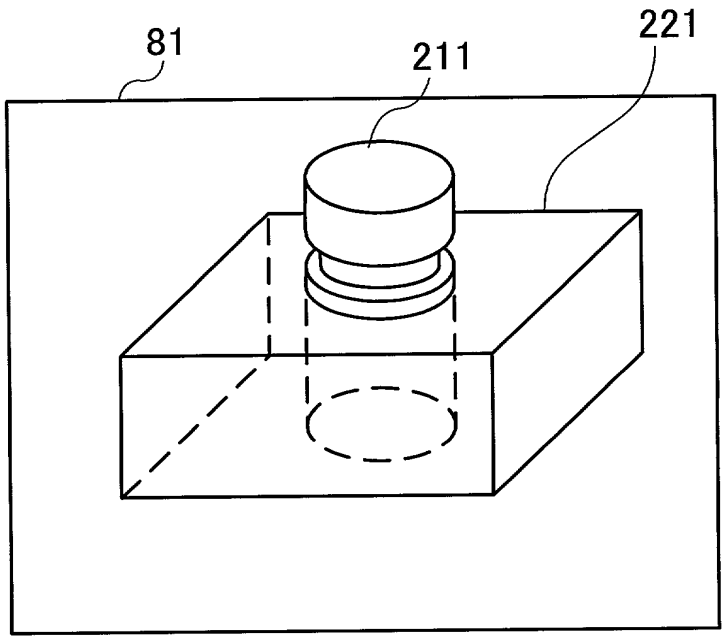


FIG. 11

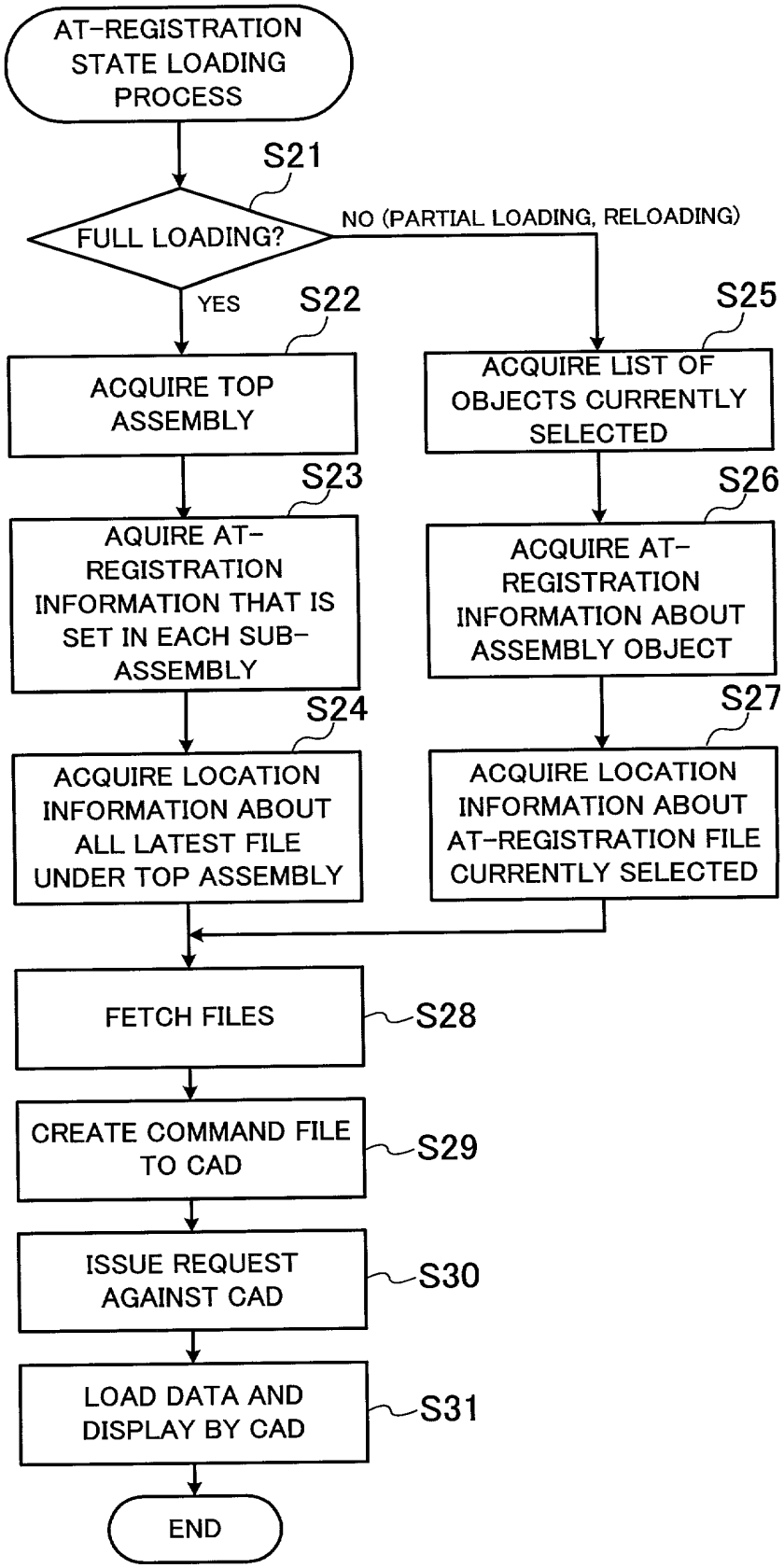
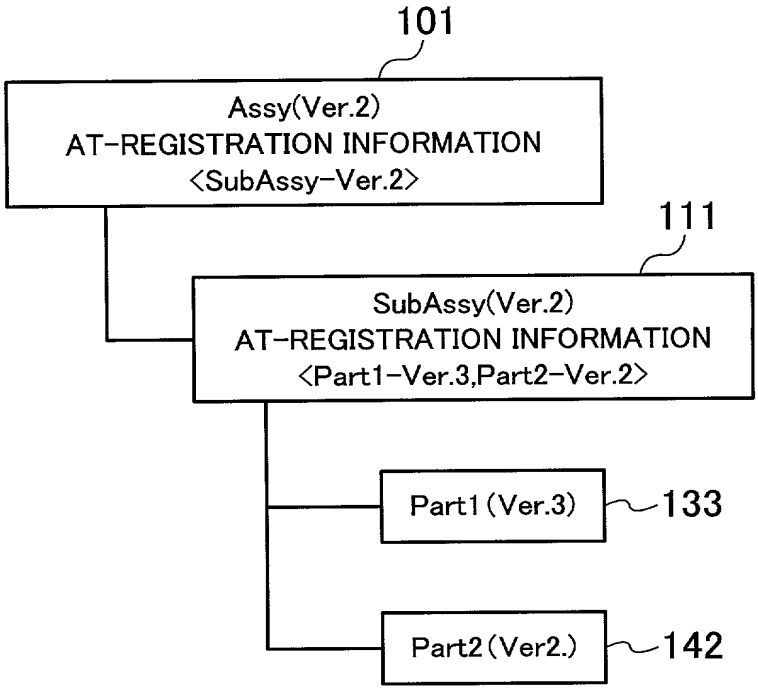

AT-REGISTRATION STATE LOADING PROCESS
S21
FULL LOADING?
NO (PARTIAL LOADING, RELOADING)
YES
S22
ACQUIRE TOP ASSEMBLY
S23
AQUIRE AT-REGISTRATION INFORMATION THAT IS SET IN EACH SUB-ASSEMBLY
S24
ACQUIRE LOCATION INFORMATION ABOUT ALL LATEST FILE UNDER TOP ASSEMBLY
S25
ACQUIRE LIST OF OBJECTS CURRENTLY SELECTED
S26
ACQUIRE AT-REGISTRATION INFORMATION ABOUT ASSEMBLY OBJECT
S27
ACQUIRE LOCATION INFORMATION ABOUT AT-REGISTRATION FILE CURRENTLY SELECTED
FETCH FILES
S28
CREATE COMMAND FILE TO CAD
S29
ISSUE REQUEST AGAINST CAD
S30
LOAD DATA AND DISPLAY BY CAD
S31
END

FIG. 12



EXAMPLE OF LOADING AT-REGISTRATION STATE

FIG. 13

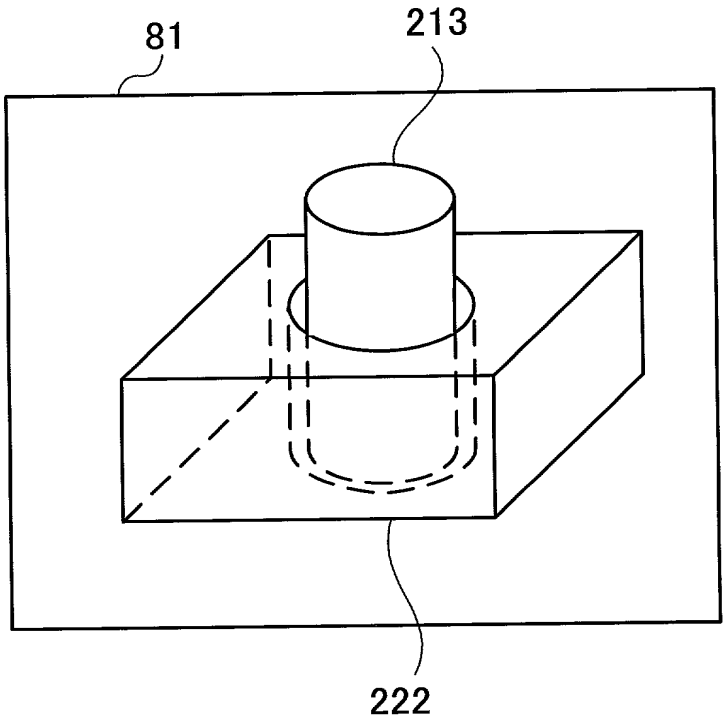


FIG. 14

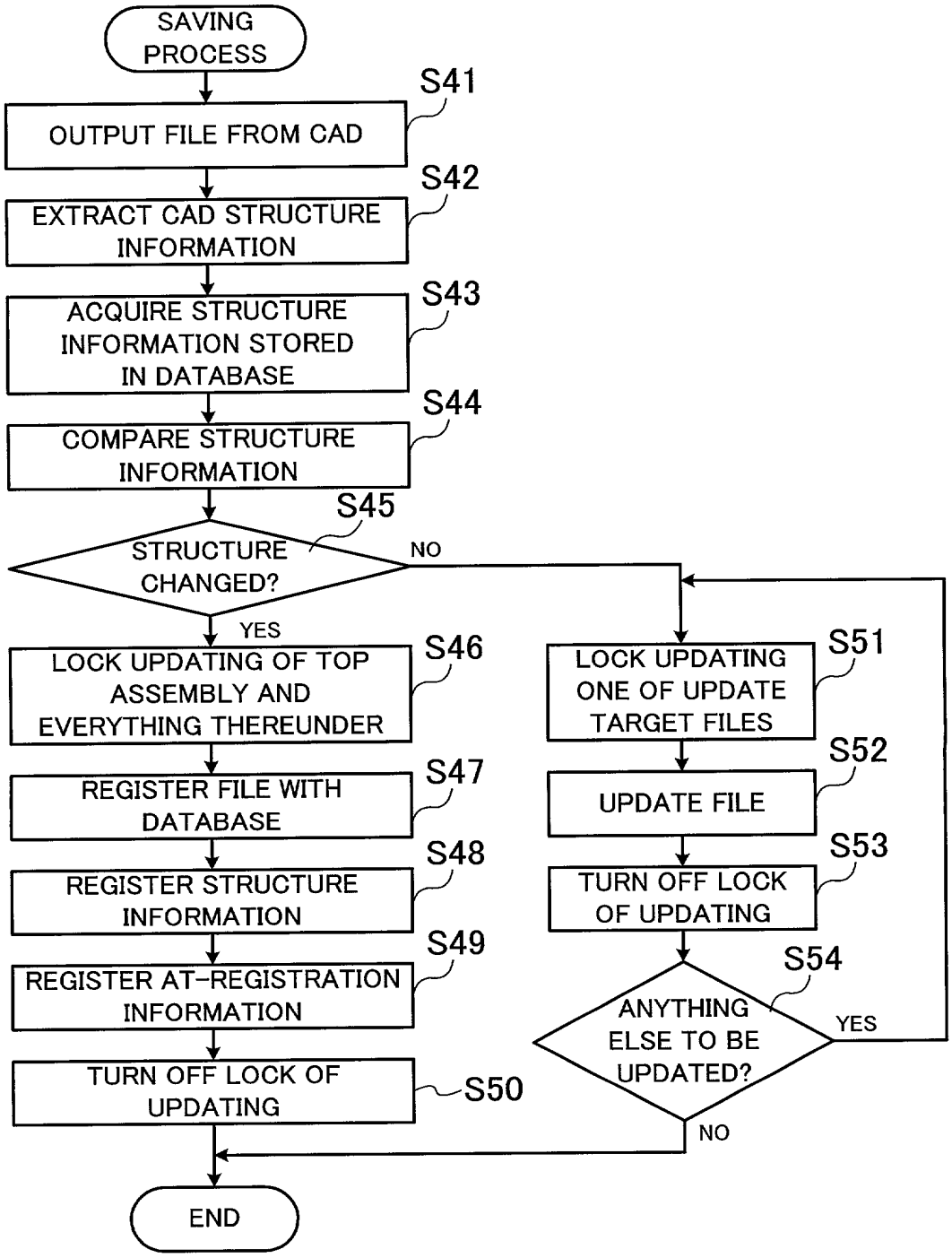
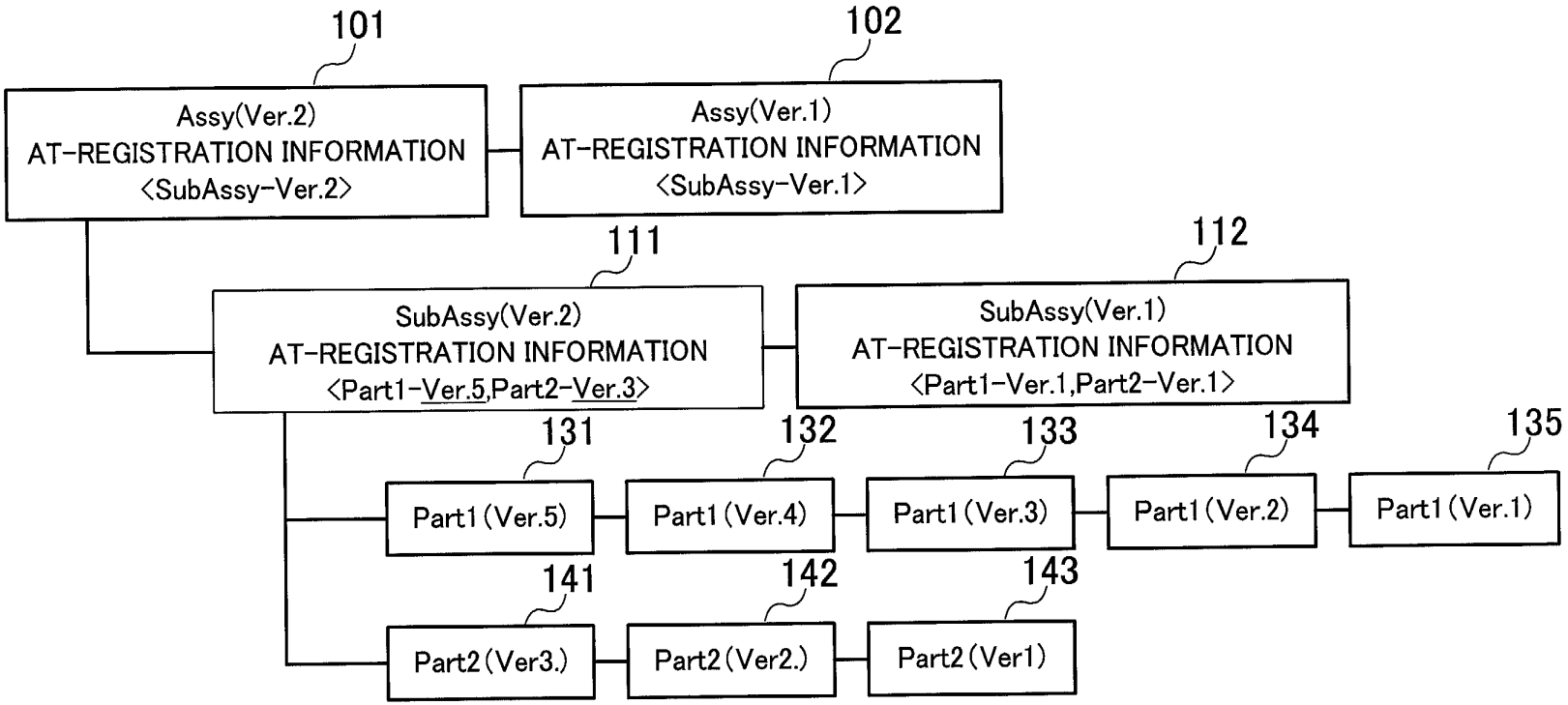

SAVING PROCESS
S41
OUTPUT FILE FROM CAD
S42
EXTRACT CAD STRUCTURE INFORMATION
S43
ACQUIRE STRUCTURE INFORMATION STORED IN DATABASE
S44
COMPARE STRUCTURE INFORMATION
S45
STRUCTURE CHANGED?
NO
YES
S46
LOCK UPDATING OF TOP ASSEMBLY AND EVERYTHING THEREUNDER
S47
REGISTER FILE WITH DATABASE
S48
REGISTER STRUCTURE INFORMATION
S49
REGISTER AT-REGISTRATION INFORMATION
S50
TURN OFF LOCK OF UPDATING
S51
LOCK UPDATING ONE OF UPDATE TARGET FILES
S52
UPDATE FILE
S53
TURN OFF LOCK OF UPDATING
S54
ANYTHING ELSE TO BE UPDATED?
YES
NO
END

FIG. 15



EXAMPLE OF DATA STRUCTURE IN DB

FIG. 16

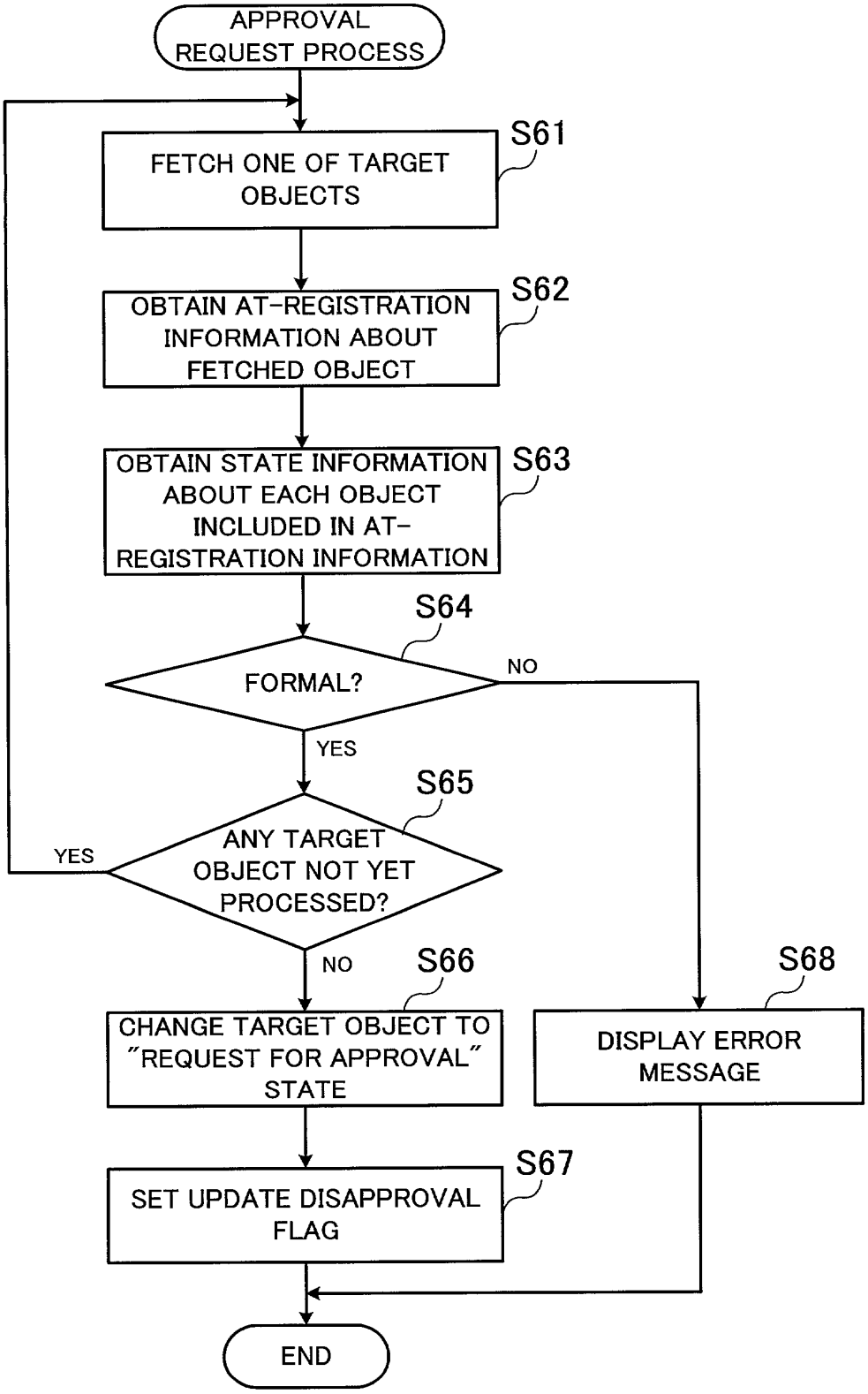

APPROVAL REQUEST PROCESS
S61
FETCH ONE OF TARGET OBJECTS
S62
OBTAIN AT-REGISTRATION INFORMATION ABOUT FETCHED OBJECT
S63
OBTAIN STATE INFORMATION ABOUT EACH OBJECT INCLUDED IN AT-REGISTRATION INFORMATION
S64
FORMAL?
NO
YES
S65
ANY TARGET OBJECT NOT YET PROCESSED?
YES
NO
S66
CHANGE TARGET OBJECT TO "REQUEST FOR APPROVAL" STATE
S68
DISPLAY ERROR MESSAGE
S67
SET UPDATE DISAPPROVAL FLAG
END

FIG. 17

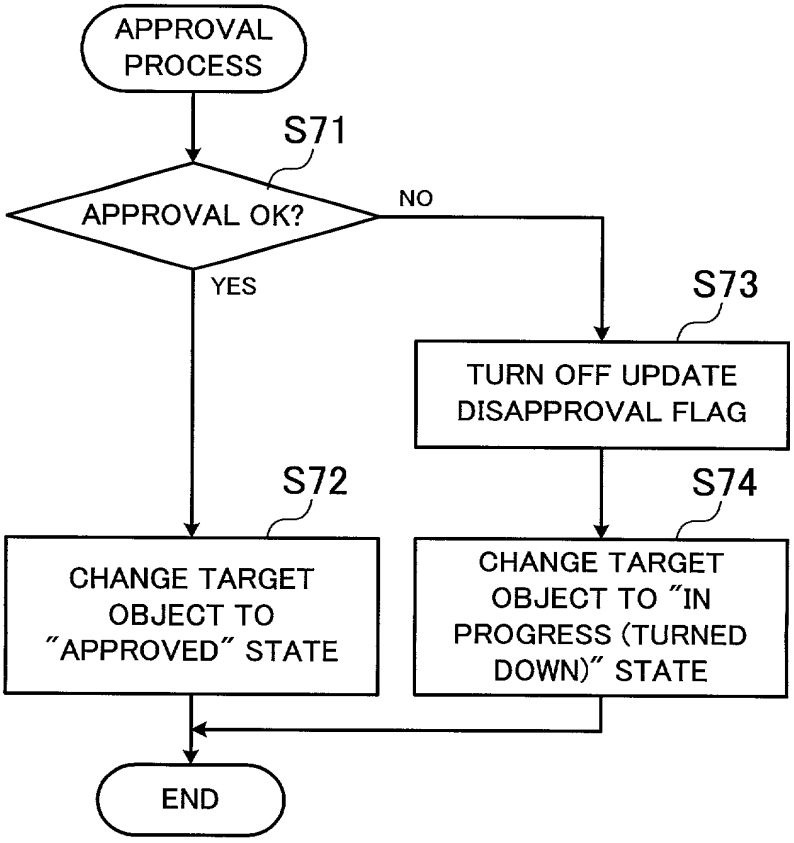

APPROVAL PROCESS
S71
APPROVAL OK?
NO
YES
S73
TURN OFF UPDATE DISAPPROVAL FLAG
S72
S74
CHANGE TARGET OBJECT TO "APPROVED" STATE
CHANGE TARGET OBJECT TO "IN PROGRESS (TURNED DOWN)" STATE
END

FIG. 18

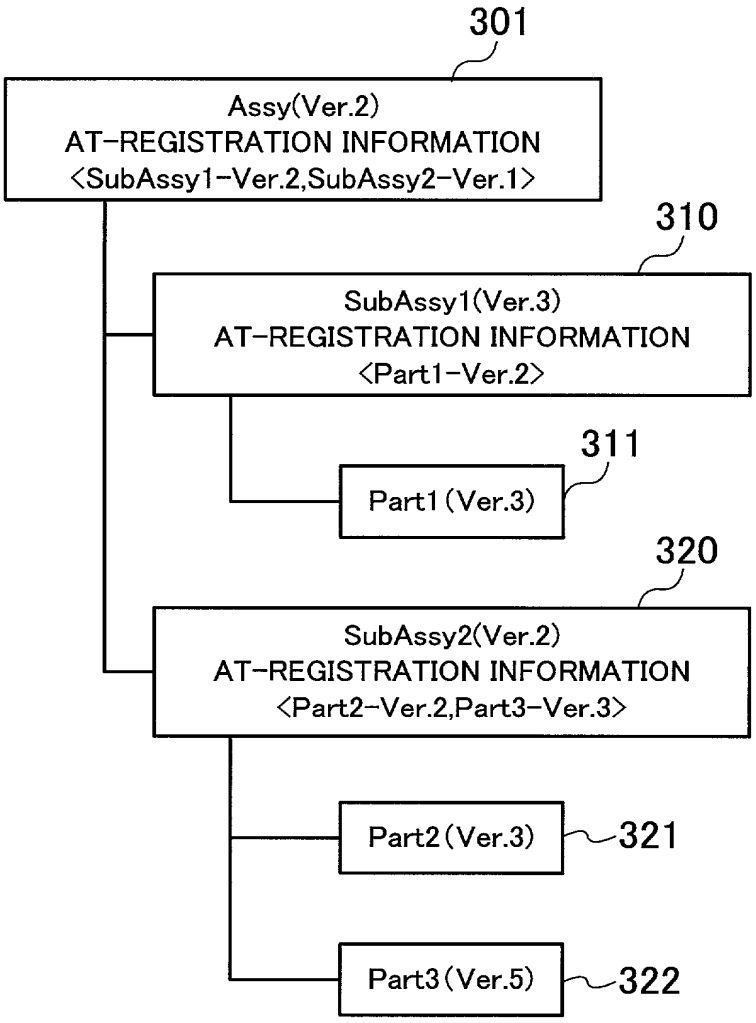

301
Assy(Ver.2)
AT-REGISTRATION INFORMATION
<SubAssy1-Ver.2,SubAssy2-Ver.1>
310
SubAssy1(Ver.3)
AT-REGISTRATION INFORMATION
<Part1-Ver.2>
311
Part1 (Ver.3)
320
SubAssy2(Ver.2)
AT-REGISTRATION INFORMATION
<Part2-Ver.2,Part3-Ver.3>
Part2 (Ver.3)
321
Part3 (Ver.5)
322

FIG. 19

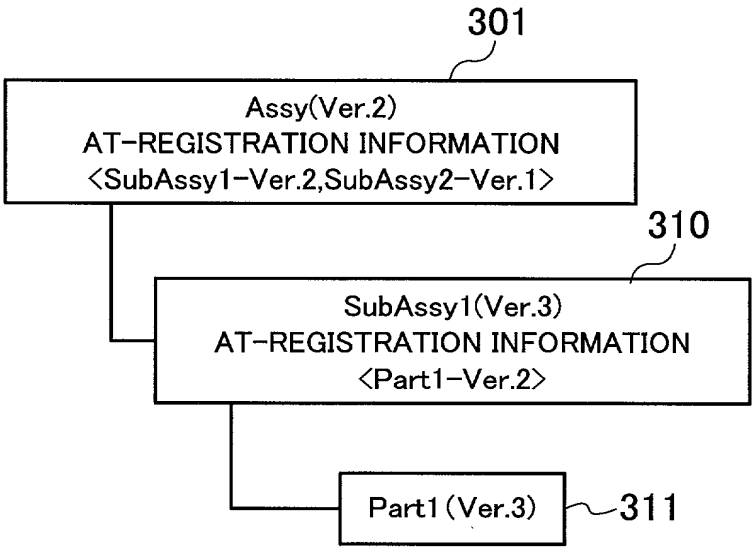

301
Assy(Ver.2)
AT-REGISTRATION INFORMATION
<SubAssy1-Ver.2,SubAssy2-Ver.1>
310
SubAssy1(Ver.3)
AT-REGISTRATION INFORMATION
<Part1-Ver.2>
Part1 (Ver.3)
311

FIG. 20

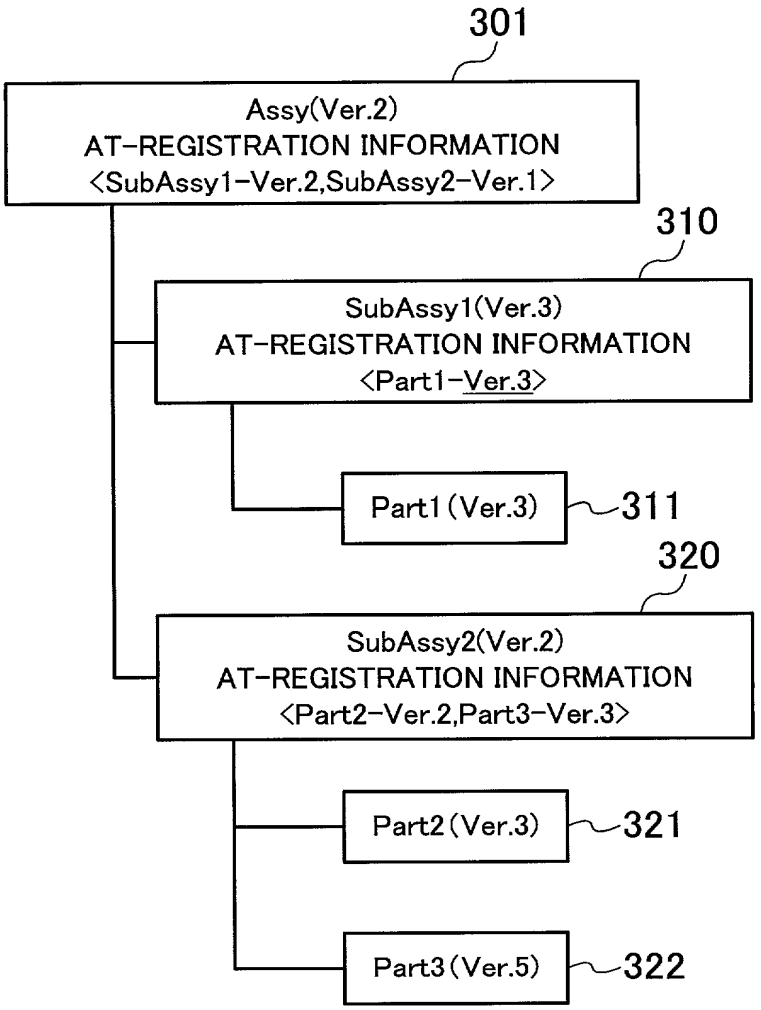

301
Assy(Ver.2)
AT-REGISTRATION INFORMATION
<SubAssy1-Ver.2,SubAssy2-Ver.1>
310
SubAssy1(Ver.3)
AT-REGISTRATION INFORMATION
<Part1-Ver.3>
Part1 (Ver.3)
311
320
SubAssy2(Ver.2)
AT-REGISTRATION INFORMATION
<Part2-Ver.2,Part3-Ver.3>
Part2 (Ver.3)
321
Part3 (Ver.5)
322

FIG. 21

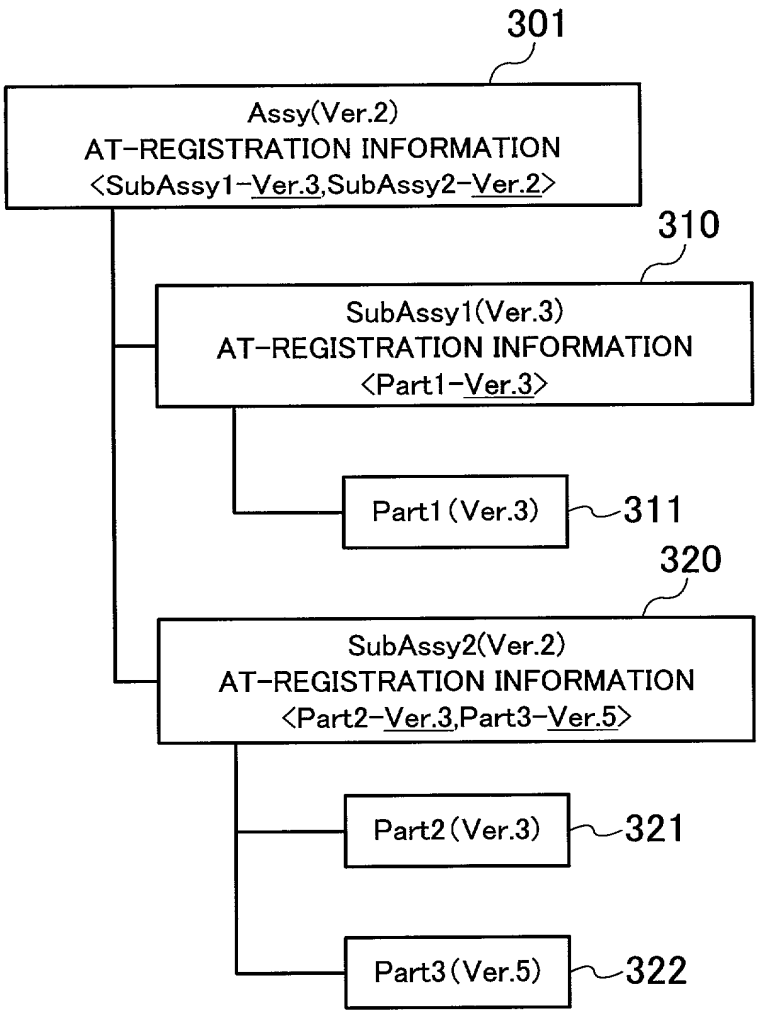

301
Assy(Ver.2)
AT-REGISTRATION INFORMATION
<SubAssy1-Ver.3,SubAssy2-Ver.2>
310
SubAssy1(Ver.3)
AT-REGISTRATION INFORMATION
<Part1-Ver.3>
Part1 (Ver.3)
311
320
SubAssy2(Ver.2)
AT-REGISTRATION INFORMATION
<Part2-Ver.3,Part3-Ver.5>
Part2 (Ver.3)
321
Part3 (Ver.5)
322

FIG. 22

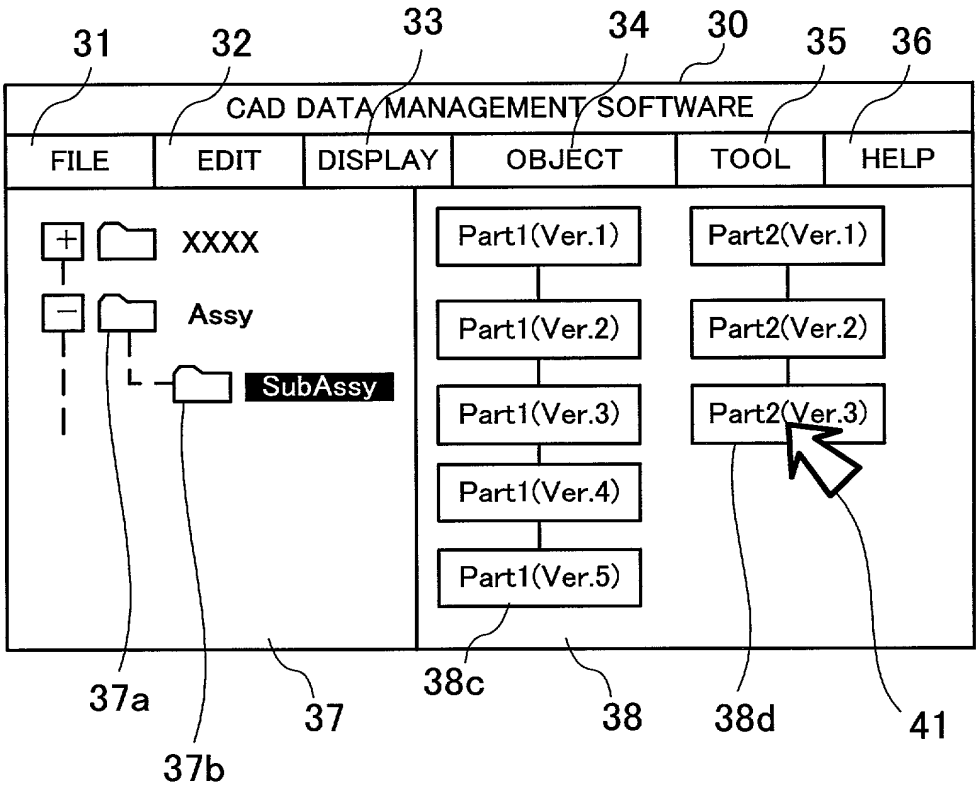

31
32
33
34
30
35
36
CAD DATA MANAGEMENT SOFTWARE
FILE
EDIT
DISPLAY
OBJECT
TOOL
HELP
XXXX
Assy
SubAssy
Part1(Ver.1)
Part1(Ver.2)
Part1(Ver.3)
Part1(Ver.4)
Part1(Ver.5)
Part2(Ver.1)
Part2(Ver.2)
Part2(Ver.3)
37a
37b
37
38c
38
38d
41

FIG. 23

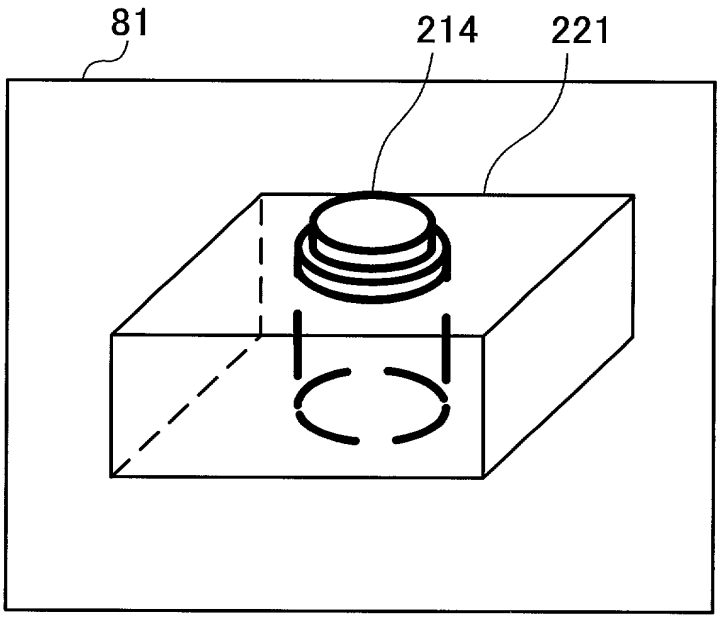


FIG. 24